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ABSTRACT

The reliability of A. Bandura's Multidimensional Scales of Perceived Self-Efficacy (MSPSE) was studied using the Cronbach alpha measure of internal consistency. The divergent validity of the MSPSE was also examined using subscale correlations, and the construct validity of the measure was studied through application of principal axes factor analysis. A sample of 500 college-bound high school students completed the MSPSE. A three-factor model was selected based on previous empirical findings, application of the scree test of R. B. Cattell, and consideration of the theoretical nature of the factors. The three factors were identified and labeled as: (1) social efficacy; (2) academic efficacy; and (3) self-regulatory. Interrelationships among the factors are examined, and potential uses of the MSPSE were discussed. (Contains 5 tables and 16 references.) (Author/SLD)

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ED 400 307

Running head: SELF-EFFICACY

An Analysis of the Reliability and Validity of Bandura's Multidimensional Scales of Perceived Self-Efficacy

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Paper presented at the meeting of American Educational Research Association, New York, NY.

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Abstract

The purpose of this study was to examine the (a) reliability of Bandura's Multidimensional Scales of Perceived Self-Efficacy (MSPSE) using the Cronbach alpha measure of internal consistency, (b) divergent validity of the MSPSE using subscale correlations, and (c) construct validity of the MSPSE through application of principal axes factor analysis. A sample of 500 college-bound high school students completed the MSPSE. A three-factor model was selected based upon (a) previous empirical findings, (b) application of Cattell's scree test, and (c) consideration of the theoretical nature of the factors. The three factors were identified and labeled (a) Social Efficacy, (b) Academic Efficacy, and (c) Self-Regulatory. Interrelationships among the factors are examined, and potential uses of the MSPSE are discussed.

An Analysis of the Reliability and Validity of Bandura's Multidimensional Scales of Perceived Self-Efficacy

Bandura's (1986) theory of self-efficacy guided the development of the Multidimensional Scales of Perceived Self-Efficacy (Bandura, 1989). Self-efficacy is concerned with the estimation that one has the ability to produce desired outcomes (Bandura, 1994). Bandura proposes that individuals who perceive themselves as capable tend to attempt and successfully execute tasks or activities. Self-efficacy studies in education have clarified and extended the role of efficacy beliefs as one mechanism underlying behavioral intention (Hill, Smith, & Mann, 1987), goal setting (Locke & Latham, 1990), persistence (Gorrell & Capron, 1988), and actual academic achievement (Collins, 1982). Precise and detailed measurement of efficacy judgements are typically highly related to subsequent school performance (Schunk, 1991).

The Multidimensional Scales of Perceived Self-Efficacy were developed in response to the theoretical and applied importance of the self-efficacy construct. The utility of such measures is based upon the integrity of the scores produced by the instrument. Studies using this instrument have recently been cited in the literature (e.g., Caprara, Pastorelli, & Bandura, 1992). Further, researchers have begun administering separate subscales from the instrument (see Zimmerman, Bandura, Martinez-Pons, 1992). However, there is very little psychometric data available on the measure. The purpose of this study was to

examine the reliability and validity of this assessment tool which is now being used to measure student self-efficacy.

Method

Participants

Participants (N = 500) were predominantly white, middle-class junior or senior public high school students attending one of nine university-sponsored ACT preparation workshops. Students attended the workshop for a variety of reasons, including personal choice, parental desire, or upon the advice of their school counselor. All students voluntarily completed the MSPSE during the day-long workshop. The composition of the sample was as follows: 50% female (N = 248), 40% male (N = 202), and 10% did not indicate their gender (N = 50).

Instrument

The Multidimensional Scales of Perceived Self-Efficacy (MSPSE) is a 57-item self-report measure which includes nine subscales. Each subscale is comprised of from four to 11 items rated along a seven-point Likert-type scale (1 = Not well at all, 3 = Not too well, 5 = Pretty well, 7 = Very well). Larger student scores indicate higher self-efficacy beliefs. The number of items for each subscale is as follows: Social Resources (4), Academic Achievement (9), Self-Regulated Learning (11), Leisure (8), Self-Regulatory (9), Other's Expectations (4), Social (4), Self-Assertive (4), and Parental Support (4).

Procedure

One of the coauthors administered the MSPSE to students

attending university-sponsored ACT Preparation Workshops. The researcher detailed the purpose for the administration of the instrument. Students were asked to respond to each of the items within the allotted time.

Results

Descriptive Statistics

Shown in Table 1 are means and standard deviations for each of the nine MSPSE subscales. In order to place descriptive statistics in the same metric as the original Likert-type scale, subscale scores for each participant were divided by the number of items on that subscale prior to computing the mean and standard deviation for that subscale. For example, the Social Resources Subscale Score for each individual was divided by four prior to computing the mean (5.3) and standard deviation (.84) since there are four items on the Social Resources subscale. The subscale means, ranging from 5.1 to 6.0, indicated that this college-bound sample tended to have positive attitudes about their capabilities to produce desired performance levels. The standard deviations were relatively homogeneous, suggesting that the students used the nine efficacy scales in similar ways.

Insert Table 1 about here

Reliability

The scores from this measure produced an overall Cronbach's (1951) alpha reliability coefficient of 0.92. This indicated

that the instrument had strong internal consistency, since coefficient alpha represents a lower bound of the proportion of variance in the scores explained by common factors underlying item performance (Crocker & Algina, 1986). Shown as diagonal elements in Table 1, alpha coefficients ranged from 0.61 to 0.87 for the Social Resources and Self-Regulated Learning subscale scores, respectively. These values demonstrate adequate response consistency.

Validity

Divergent Validity. Correlations between subscale pairs are shown as off-diagonal elements in Table 1. These coefficients were relatively small, ranging from 0.13 (Academic Achievement-Parental Support Subscales) to 0.56 (Self-Regulated Learning-Other's Expectations Subscales). This revealed a fairly low rate of measurement overlap between the nine subscales, with anywhere from 2% to 31% of the variance shared. Thus this instrument may be able to discriminate between the nine self-efficacy constructs assessed with this measure.

Construct Validity. To ascertain the structure of the 57-item MSPSE, (common) factors were extracted using (a) principal factor analysis, (b) squared multiple correlations as initial communality estimates, (c).the raw score data set, and (d) PROC FACTOR in SAS. A promax rotation (Hendrickson & White, 1964) was selected with varimax (Kaiser, 1958) prerotation where power of k=3 was chosen to compute the target pattern. This resulted in eight factors with eigenvalues greater than one. Approximately

89% of the total variance was accounted for by the eight-factor solution. Inspection of Cattell's (1966) scree test suggested that three factors may better represent the self-efficacy factor structure. Gorsuch (1983, p.208) suggests when interpreting obliquely rotated factors, ideally the (a) factor structure matrix, (b) rotated factor pattern matrix, and (c) reference structure matrix would be presented so that the reader would have the greatest amount of information to guide conclusions. Shown in Table 2 are the (a) variable-factor correlations (factor structure) and (b) variance explained by each factor ignoring other factors (that is, the sum of the squared elements of the factor structure corresponding to each factor). The three factors in combination accounted for approximately 62% of the total variance of the item set. For interpretational clarity, a salient loading (Gorsuch, 1983, p.208) of 0.35 was selected as one that is sufficiently high to assume a variable-factor relationship exits. The nature of the factors obtained were intuitively attractive and were labeled (Social Efficacy, Academic Efficacy, Self-Regulatory) by the authors.

Insert Table 2 about here

Shown in Table 3 are standardized regression coefficients for predicting the variables from the factors (rotated factor pattern).

Insert Table 3 about here

Shown in Table 4 are the (a) semipartial correlations between variables and factors, removing from each factor the effects of other factors and (b) variance explained by each factor eliminating the effects of other factors (that is, the sum of the squared elements of the reference structure corresponding to each factor).

Insert Table 4 about here

Shown in Table 5 are pairwise factor correlations.

Insert Table 5 about here

Discussion

The Multidimensional Scales of Perceived Self-Efficacy appears to provide a promising measure for investigating high school students' self-efficacy. The scores from the measure were sufficiently reliable in terms of internal consistency. The divergent and construct validity results, taken together, seem to indicate that the general theoretical framework, and the scales designed to assess it, were valid. The nine subscales measured general self-efficacy components that were distinguishable from each other. These components produced three underlying

measurement dimensions. Additionally, the three efficacy factors located here (Social, Academic, and Self-Regulation) strongly resemble those identified in a prior study (Caprara, Pastorelli, & Bandura, 1992). Further research is need to assess the stability of these factors across different samples and groups within academic settings.

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Table 1

Correlation Matrix, Descriptive Statistics, and Reliabilities for the Multidimensional Scales of Perceived Self-Efficacy (N = 500)

Subscale	SR	AA	SRL	L	SR	OE	S	SA	PS
Social Resources (SR)	.61								
Academic Achievement	.24	.74							
Self-Regulated Learning	.37	.47	.87						
Leisure (L)	.31	.24	.32	.74					
Self-Regulatory (SR)	.22	.22	.41	.12	.80				
Other's Expectations	.41	.34	.56	.30	.44	.74			
Social (S)	.44	.21	.33	.45	.15	.44	.83		
Self-Assertive (SA)	.32	.23	.25	.43	.13	.40	.53	.84	
Parental Support (PS)	.48	.13	.33	.31	.27	.39	.34	.26	.71
M	5.3	5.2	5.1	5.2	6.0	5.3	5.9	5.6	5.1
SD	,84	.73	.86	.85	.89	.91	.92	1.03	1.14

Note 1. Statistics reported in the main diagonal are internal consistency estimates using coefficient alpha.

Note 2. Subscale scores for each participant were divided by the number of items on that subscale prior to computing the mean and standard deviation for that subscale.

Table 2

Factor Structure (Correlations), Eigenvalues, and Percent of Variance for the MSPSE (N = 500)

	Factor 1 Social Efficacy	Factor 2 Academic Efficacy	Factor 3 Self-Regulatory
1. How well can you get teachers to help you when you get stuck on school work?		.36	
2. How well can you get another student to help you when you get stuck on homework?			
3. How well can you get adults to help you when you have social problems?	.38		.37
4. How well can you get a friend to help you when you have social problems?	.41		
5. How well can you learn general mathematics?			
6. How well can you learn algebra?		.43	
7. How well can you learn science?		.52	
8. How well can you learn biology?		.52	
9. How well can you learn reading and writing language skills?		.46	
10. How well can yo learn to use computers?			
11. How well can you learn a foreign language?		.40	
12. How well can you learn social studies?		.43	
13. How welll can you learn English grammar?		.51	
14. How well can you finish homework assignments by deadlines?		.48	.49
15. How well can you study when there are other interesting things to do?		.53	.48
16. How well can you concentrate on school subjects?		.65	.61
17. How well can you take class notes of class instruction?		.51	.41

18. How well can you use the library to get information for class assignments?		.57	.36
19. How well can you plan your school work?		.64	.58
20. How well can you organize your school work?		.55	.55
21. How well can you remember information presented in class and textbooks?		.62	
22. How well can you arrange a place to study without distractions?		.51	.41
23. How well can you motivate yourself to do school work?		.62	.54
24. How well can you participate in class discussions?	.52	.45	
25. How well can you learn sports skills?	.59		
26. How well can you learn dance skills?	.45		
27. How well can you learn music skills?			
28. How well can you do the kinds of things that are needed to work on the school newspaper?		.40	
29. How well can you do the kinds of things needed to be a member of the school government?	.39	.45	
30. How well can you do the kinds of things needed to take part in school plays?			
31. How well can you do regular physical education activities?	.52		
32. How well can you learn skills needed for team sports (for example, basketball, volleyball, swimming, football, soccer)?	.58		
33. How well can you resist peer pressure to do the things in school that can get you into trouble?			.59
34. How well can you stop yourself from skipping school when you feel bored or upset?			.53
35. How well can you resist peer pressure to smoke cigarettes?			.57

36. How well can you resist peer pressure to drink beer, wine, or liquor?			.61
37. How well can you resist peer pressure to smoke marijuana?			.52
38. how well can you resist peer pressure to use pills (uppers, downers)?			.45
39. How well can you resist peer pressure to use crack?			
40. How well can you resist pressure to have sexual intercourse?			.62
41. How well can you control your temper?			.43
42. How well can you live up to what your parents expect of you?		.41	.61
43. How well can you live up to what your teachers think of you?		.56	.65
44. How well can you live up to what your peers expect of you?	.43		
45. How well can you live up to what you expect of yourself?	.42		
46. How well can you make and keep friends of the opposite sex?	.59		
47. How well can you make and keep friends of the same sex?	.58		
48. How well can you carry on conversations with others?	.73		
49. How well can you work in a group?	.65		
50. How well can you express your opinions when others classmates disagree with you?	.63		
51. How well can you stand up for yourself when you feel you are being treated unfairly?	.66		
52. How well can you deal with situations where others are annoying you or hurting your feelings?	.60		
53. How well can you stand firm to someone who is asking you to do something unreasonable or inconvenient?	.60		
54. How much can you get your parent(s) to help you with a problem?	.43		.41

55. How well can you get your brother(s) and sister(s) to help you with a problem?			
56. How well can you get your parents to take part in school activities?			
57. How well can you get people outside the school to take an interest in your school (for example, community groups, churches)?	.37		
Variance explained by each factor ignoring other factors	7.34	7.72	6.74

Note. Only correlations whose magnitude is greater than 0.35 are presented.

Table 3

Factor Pattern (Standard Regression Coefficients) for the MSPSE (N = 500)

	Factor 1 Social Efficacy	Factor 2 Academic Efficacy	Factor 3 Self-Regulatory
1. How well can you get teachers to help you when you get stuck on school work?			
2. How well can you get another student to help you when you get stuck on homework?			
3. How well can you get adults to help you when you have social problems?			
4. How well can you get a friend to help you when you have social problems?	.38		
5. How well can you learn general mathematics?		.35	
6. How well can you learn algebra?		.47	
7. How well can you learn science?		.63	
8. How well can you learn biology?		.58	
9. How well can you learn reading and writing language skills?		.50	
10. How well can yo learn to use computers?			
11. How well can you learn a foreign language?		.43	
12. How well can you learn social studies?		.49	
13. How welll can you learn English grammar?		.52	
14. How well can you finish homework assignments by deadlines?		.36	
15. How well can you study when there are other interesting things to do?		.44	
16. How well can you concentrate on school subjects?		.55	
17. How well can you take class notes of class instruction?		.41	

18. How well can you use the library to get information for class assignments?		.47	
19. How well can you plan your school work?		.47	.36
20. How well can you organize your school work?		.39	.37
21. How well can you remember information presented in class and textbooks?		.60	
22. How well can you arrange a place to study without distractions?		.40	
23. How well can you motivate yourself to do school work?		.49	
24. How well can you participate in class discussions?	.43		
25. How well can you learn sports skills?	.65		
26. How well can you learn dance skills?	.42		
27. How well can you learn music skills?			
28. How well can you do the kinds of things that are needed to work on the school newspaper?		.36	
29. How well can you do the kinds of things needed to be a member of the school government?		.39	
30. How well can you do the kinds of things needed to take part in school plays?			
31. How well can you do regular physical education activities?	.55		
32. How well can you learn skills needed for team sports (for example, basketball, volleyball, swimming, football, soccer)?	.65		
33. How well can you resist peer pressure to do the things in school that can get you into trouble?			.57
34. How well can you stop yourself from skipping school when you feel bored or upset?			.52
35. How well can you resist peer pressure to smoke cigarettes?			.66

36. How well can you resist peer pressure to drink beer, wine, or liquor?			.70
37. How well can you resist peer pressure to smoke marijuana?			.57
38. How well can you resist peer pressure to use pills (uppers, downers)?			.49
39. How well can you resist peer pressure to use crack?			
40. How well can you resist pressure to have sexual intercourse?			.62
41. How well can you control your temper?			.41
42. How well can you live up to what your parents expect of you?			.52
43. How well can you live up to what your teachers think of you?			.49
44. How well can you live up to what your peers expect of you?	.36		
45. How well can you live up to what you expect of yourself?	.36		
46. How well can you make and keep friends of the opposite sex?	.59		
47. How well can you make and keep friends of the same sex?	.57		
48. How well can you carry on conversations with others?	.70		
49. How well can you work in a group?	.60		
50. How well can you express your opinions when others classmates disagree with you?	.60		
51. How well can you stand up for yourself when you feel you are being treated unfairly?	.66		
52. How well can you deal with situations where others are annoying you or hurting your feelings?	.59		
53. How well can you stand firm to someone who is asking you to do something unreasonable or inconvenient?	.58		
54. How much can you get your parent(s) to help you with a problem?	.38		.36

55. How well can you get your brother(s) and sister(s) to help you with a problem?			
56. How well can you get your parents to take part in school activities?			
57. How well can you get people outside the school to take an interest in your school (for example, community groups, churches)?			

Table 4

Reference Structure (Semipartial Correlations) for the MSPSE (N = 500)

	Factor 1 Social Efficacy	Factor 2 Academic Efficacy	Factor 3 Self-Regulatory
1. How well can you get teachers to help you when you get stuck on school work?			
2. How well can you get another student to help you when you get stuck on homework?			
3. How well can you get adults to help you when you have social problems?			
4. How well can you get a friend to help you when you have social problems?	.36		
5. How well can you learn general mathematics?			
6. How well can you learn algebra?		.40	
7. How well can you learn science?		.54	
8. How well can you learn biology?		.50	
9. How well can you learn reading and writing language skills?		.43	
10. How well can yo learn to use computers?			
11. How well can you learn a foreign language?		.37	
12. How well can you learn social studies?		.42	
13. How welll can you learn English grammar?		.45	
14. How well can you finish homework assignments by deadlines?			
15. How well can you study when there are other interesting things to do?		.38	
16. How well can you concentrate on school subjects?		.48	
17. How well can you take class notes of class instruction?		.35	

18. How well can you use the library to get information for class assignments?		.41	
19. How well can you plan your school work?		.41	
20. How well can you organize your school work?			
21. How well can you remember information presented in class and textbooks?		.52	
22. How well can you arrange a place to study without distractions?			
23. How well can you motivate yourself to do school work?		.42	
24. How well can you participate in class discussions?	.41		
25. How well can you learn sports skills?	.62		
26. How well can you learn dance skills?	.40		
27. How well can you learn music skills?			
28. How well can you do the kinds of things that are needed to work on the school newspaper?			
29. How well can you do the kinds of things needed to be a member of the school government?			
30. How well can you do the kinds of things needed to take part in school plays?			
31. How well can you do regular physical education activities?	.52		
32. How well can you learn skills needed for team sports (for example, basketball, volleyball, swimming, football, soccer)?	.62		
33. How well can you resist peer pressure to do the things in school that can get you into trouble?			.50
34. How well can you stop yourself from skipping school when you feel bored or upset?			.46
35. How well can you resist peer pressure to smoke cigarettes?			.59

36. How well can you resist peer pressure to drink beer, wine, or liquor?			.63
37. How well can you resist peer pressure to smoke marijuana?			.51
38. How well can you resist peer pressure to use pills (uppers, downers)?			.44
39. How well can you resist peer pressure to use crack?			
40. How well can you resist pressure to have sexual intercourse?			.55
41. How well can you control your temper?			.37
42. How well can you live up to what your parents expect of you?			.46
43. How well can you live up to what your teachers think of you?			.44
44. How well can you live up to what your peers expect of you?			
45. How well can you live up to what you expect of yourself?			
46. How well can you make and keep friends of the opposite sex?	.56		
47. How well can you make and keep friends of the same sex?	.54		
48. How well can you carry on conversations with others?	.67		
49. How well can you work in a group?	.57		
50. How well can you express your opinions when others classmates disagree with you?	.57		
51. How well can you stand up for yourself when you feel you are being treated unfairly?	.63		
52. How well can you deal with situations where others are annoying you or hurting your feelings?	.57		
53. How well can you stand firm to someone who is asking you to do something unreasonable or inconvenient?	.55		
54. How much can you get your parent(s) to help you with a problem?	.36		

55. How well can you get your brother(s) and sister(s) to help you with a problem?			
56. How well can you get your parents to take part in school activities?			
57. How well can you get people outside the school to take an interest in your school (for example, community groups, churches)?			
Variance explained by each factor eliminating other factors	5.54	3.92	3.81

Table 5

Inter-Factor Correlations (N = 500)

Factor	Social Efficacy	Academic Efficacy	Self-Regulatory
Social Efficacy	1.00		
Academic Efficacy	.31	1.00	
Self-Regulatory	.17	.45	1.00